ECONOMIC ANALYSIS OF EPA'S DIRECT FINAL RULE AMENDING 40 CFR PART 257 AND 258

CRITERIA FOR CLASSIFICATION OF SOLID WASTE DISPOSAL FACILITIES AND PRACTICES AND CRITERIA FOR MUNICIPAL SOLID WASTE LANDFILLS: DISPOSAL OF RESIDENTIAL LEAD-BASED PAINT WASTE

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EXECUTIVE SUMMARY

ES.1 Purpose of the Action

This document presents EPA's analysis of the economic impacts of a Direct Final Rule being published in the Federal Register. The rule amends two sections of the RCRA Subtitle D standards, 40 CFR 257.2 and 258.2, by amending the definition of a municipal solid waste landfill (MSWLF) unit, and by adding definitions for construction and demolition (C&D) landfill and residential lead-based paint (LBP) waste. LBP waste includes waste from residential abatement, rehabilitation, and renovation and remodeling activities.

ES.2 Justification for the Action

This rule addresses a consequence of a July 31, 2000 policy statement by EPA's Office of Solid Waste that interpreted residential LBP waste as a household waste under 40 CFR Part 261.4(b)(1). By defining residential LBP waste as a household waste, the July policy statement meant that such waste was no longer subject to the RCRA hazardous waste disposal requirements and could be disposed of in MSWLFs and municipal solid waste combustors according to State and local requirements. However, under 40 CFR Part 258.2, a C&D landfill that receives residential LBP waste could be deemed to be receiving household waste and may need to comply with EPA's Municipal Solid Waste Landfill Criteria found in 40 CFR part 258. The Direct Final Rule will expressly allow C&D landfills to receive residential LBP waste without becoming subject to the requirements for a MSWLF in part 258.

ES.3 Economic Impacts of the Action

The Direct Final Rule will impose no additional costs but may result in cost savings and incremental public health benefits. The action authorizes the disposal of residential LBP waste in C&D landfills, where previously under the July 2000 policy statement, disposal was authorized only in MSWLFs. As a result, EPA believes that, in those parts of the country where it is cheaper to transport and dispose of residential LBP waste in C&D landfills compared to MSWLFs, some residential LBP waste will be diverted from MSWLFs to C&D landfills. Where this occurs, generators will benefit from lower waste management and disposal costs. Residential LBP waste transporters will continue to transport residential LBP waste for disposal, except disposal will take place at C&D landfills, as opposed to MSWLFs. Some MSWLF operators will experience a reduction in demand for disposal services, which will be offset by an increase in demand for disposal services at C&D landfills.

For this analysis, EPA assumes that only residential LBP waste generators in the Midwest, Northeast, and South regions would potentially shift from disposal in MSWLFs to disposal in C&D

landfills, based on an analysis of the relative costs of MSW and C&D disposal by region. EPA further assumes that the percentage of residential LBP waste that would be potentially affected is proportional to the share of these three regions in the number of housing units with LBP, which is 84.4 percent. Under these assumptions, up to an estimated 0.87 million tons of residential LBP waste will be diverted from MSWLFs to C&D landfills annually. This represents up to 0.73 percent of the total volume of waste disposed of in MSWLFs annually. This shift in disposal would save residential LBP waste generators in the Midwest, Northeast, and South regions up to $16.76 million annually. The savings accruing to generators of residential LBP waste is estimated to be as high as $0.79 million per year, while the savings accruing to generators of residential renovation and remodeling (R&R) LBP waste would be up to $15.98 million per year.

ES.4 Benefits of the Action

The Direct Final Rule may result in savings in residential LBP waste disposal costs in regions of the country where the total cost of transporting and disposing of residential LBP waste is lower for C&D landfills versus MSWLFs. EPA estimates that up to $0.79 million in savings will accrue to generators of residential LBP abatement waste. Of this, an estimated 39.7 percent, or up to $0.31 million, will be generated annually in the public housing sector. EPA assumes that in the public sector, any savings in residential LBP waste management and disposal costs will be used to conduct additional LBP abatements. Given an average cost for LBP abatement in public housing units of $3,650, the $0.31 million in annual savings would fund as many as 86 additional abatements each year. The result of this will be an acceleration in the elimination of LBP hazards and a reduction in the exposure of sensitive populations, particularly children, to the hazards of LBP. These hazards include decreased intelligence (lower IQ), behavioral problems, reduced physical stature and growth, and impaired hearing (Task Force 2000).

ES.5 Other Impacts of the Action

EPA has analyzed the potential impacts of this action on small entities, unfunded mandates, environmental justice, and children's health, in accordance with the requirements of various executive orders and statutes. Given the deregulatory nature of the action and the overall savings estimated for the action, EPA finds there are no adverse impacts.

CHAPTER ONE

INTRODUCTION

1.1 Description of the Direct Final Rule

This document presents EPA's analysis of the economic impacts of a Direct Final Rule being published in the Federal Register. The rule amends two sections of the RCRA Subtitle D standards, 40 CFR 257.2 and 258.2, by amending the definition of a municipal solid waste landfill (MSWLF) unit, and by adding definitions for construction and demolition (C&D) landfill and residential lead-based paint waste. Specifically, this rule:

- Amends the definition of MSWLF unit in 4 0 CFR 257.2 and 258.2 by adding a statement at the end of the definition. The amended definition will thus read:

> "*Municipal solid waste landfill (MSWLF) unit* means a discrete area of land or an excavation that receives household waste, and that is not a land application unit, surface impoundment, injection well, or waste pile, as those terms are defined under §257.2. A MSWLF unit also may receive other types of RCRA Subtitle D wastes, such as commercial solid waste, nonhazardous sludge, and industrial solid waste. Such a landfill may be publicly or privately owned. A MSWLF unit may be a new MSWLF unit, an existing MSWLF unit or a lateral expansion. A construction and demolition landfill that receives residential lead-based paint waste and does not receive any other household waste is not a MSWLF unit."

- Adds the definition of construction and demolition (C&D) landfill as follows:

> "*Construction and demolition (C&D) landfill* means a solid waste disposal facility subject to the requirements in part 257, subparts A or B of this chapter that receives construction and demolition waste and does not receive hazardous waste (defined in §261.3 of this chapter) (other than conditionally exempt small quantity generator waste, defined in §261.5 of this chapter) or industrial solid waste (defined in §258.2 of this chapter). A C&D landfill typically receives any one or more of the following types of solid wastes: roadwork material, excavated material, demolition waste, construction/renovation waste, and site clearance waste."

- Adds the definition of residential lead-based paint waste as follows:

> "*Residential lead-based paint waste* means waste generated as a result of lead-based paint activities (including abatement, rehabilitation, renovation and remodeling) in homes and other residences. The term residential lead-based paint waste includes, but is not limited to, lead-based paint debris, chips, dust, and sludges."

1.2 Rule Justification

This rule addresses a consequence of a July 31, 2000 policy statement by EPA's Office of Solid Waste that interpreted residential LBP waste as a household waste under 40 CFR Part 261.4(b)(1). By defining residential LBP waste as a household waste, the July policy statement meant that such waste was no longer subject to the RCRA hazardous waste disposal requirements and could be disposed of in MSWLFs and municipal solid waste combustors according to State and local requirements. However, under 40 CFR Part 258.2, a C&D landfill that receives residential LBP waste could be deemed to be receiving household waste and may need to comply with EPA's Municipal Solid Waste Landfill Criteria found in 40 CFR part 258. This rule is designed to expressly allow C&D landfills to receive residential LBP waste without becoming subject to the requirements for a MSWLF in part 258.

1.3 Rule Implementation

The Part 257 and 258 regulations being amended by the Direct Final Rule are implemented by States who have received EPA approval of their RCRA Subtitle D programs. Before the amendment can be implemented, therefore, it may be necessary for States and territories themselves to promulgate a rule or similar action to amend their Subtitle D permitting program. As of March 1, 2000, 49 States and territories had received approval of their Subtitle D programs.

1.4 Entities Subject to the Direct Final Rule

Those entities affected by this action include industries involved in LBP abatement activities, residential renovation and remodeling activities, and those involved in residential LBP waste transportation and disposal.

1.5 Types of LBP Waste Being Regulated

The Direct Final Rule will apply to all residential LBP waste, regardless of amount generated. Residential LBP waste is further defined in Chapter Two, and includes LBP debris, as well as LBP paint chips, dust, and sludges. The use of the term *residential* LBP waste indicates the action applies

to waste generated as a result of lead-based paint activities (including abatement, rehabilitation, renovation, and remodeling) in homes and other residences. Not included in this definition are residential LBP demolition wastes and LBP wastes from nonresidential structures such as public and commercial buildings, warehouses, bridges, water towers, and transmission towers. These wastes remain subject to RCRA hazardous waste management requirements if the generator determines that they are hazardous.

1.6 Deregulatory Nature of the Direct Final Rule

The Direct Final Rule will ensure that residential LBP waste safely disposed of in either C&D landfills or MSWLFs. Because this action results in a wider range of disposal options for States to provide to residential LBP waste generators, thus lowering residential LBP waste disposal costs, it is considered deregulatory in nature.

1.7 Overview of the Economic Analysis

This Economic Analysis (EA) analyzes the costs and benefits and other impacts associated with the Direct Final Rule. Under Executive Order 12866 (EO 12866), EPA is required to determine whether any rule constitutes a "significant regulatory action" as defined by section 3(f)(1) of EO 12866. In order to make this determination, EPA has prepared this economic analysis to assess the costs and benefits of the rule.

The Direct Final Rule amends the definition of MSWLF unit in 40 CFR 257.2 and 258.2 by inserting at the end of the definition, the sentence, "A construction and demolition landfill that receives residential lead-based paint waste and does not receive any other household waste is not a MSWLF unit." The amendment, as shown in this EA, may reduce the costs associated with residential LBP waste management and disposal, as it allows a wider range of disposal options and avoids compliance costs for C&D landfills that would otherwise either have to comply with Part 258 criteria or refuse to accept residential LBP waste. By reducing the costs of managing and disposing of residential LBP waste, EPA expects the rule to increase the number of housing units with LBP to be abated. Thus, the rule will have the effect of accelerating the rate at which LBP hazards are eliminated, thereby reducing the number of children exposed to such hazards.

The EA contains 8 chapters. The outline of the EA is as follows:

- Chapter Two presents a market profile of the industries affected by the Direct Final Rule.
- Chapter Three describes the regulatory action and EPA's justification for this action
- Chapter Four contains data on the present costs of residential LBP waste management and disposal and the costs under the Direct Final Rule.
- Chapter Five discusses the benefits of the Direct Final Rule.
- Chapter Six assesses the economic impacts of this action

- Chapter Seven summarizes the EA and presents some conclusions
- Chapter Eight contains a list of cited references

CHAPTER TWO

MARKET PROFILE OF AFFECTED SECTORS

The Direct Final Rule will affect a number of industry sectors, including contractors involved in LBP abatement activities, renovators and remodelers that generate residential LBP waste, waste transporters, and waste disposal facility operators. This chapter examines the size and other characteristics of industries that may be potentially affected by the rule. As part of this profile, we present estimates of the baseline level of abatement and R&R activities covered by the action. The first two sections present the baseline information for abatement (Section 2.1), and renovation and remodeling (Section 2.2) activities. Sections 2.3 and 2.4 profile the affected waste transport and waste disposal sectors.

2.1 LBP Abatement

A variety of federal, state, and local legislation encourages or requires owners of buildings to abate the hazards of LBP, particularly in residential settings. Abatement has been defined as any measure, or set of measures, designed to permanently eliminate LBP hazards.[1]

Since federal and state legislative and policy initiatives largely determine the level and nature of abatement activity, this section first describes current estimates of the number of abatement projects undertaken annually in housing, and then characterizes the industries involved in abatement activities.

Residential Lead-Based Paint Waste (LBP Waste) is defined as:
waste generated as a result of lead-based paint activities (including abatement, rehabilitation, renovation, and remodeling) in homes and other residences. The term residential lead-based paint waste includes, but is not limited to, lead-based paint debris, chips, dust, and sludges.

Figure 2-1. Definition of Residential LBP Waste. Source: Direct Final Rule

[1] Deleading, a related term, refers to actions taken to eliminate lead-based paint or lead-based paint hazards or to plan such activities in non-residential public or commercial buildings.

2.1.1 Determinants of Residential Abatement Levels

Residential lead abatement standards have largely been directed by the evolving policies of the Department of Housing and Urban Development (HUD) and other federal agencies. Current HUD programs are administered under the Lead-Based Paint Hazard Reduction Act, also known as Title X of the Housing and Community Act of 1992. Title X updates many regulations affecting abatement activities, particularly by adding Title IV, Lead Exposure Reduction, to the Toxic Substances Control Act (TSCA) (see Figure 2-2). The various sections of Title IV set policies and mandate regulations and guidelines for safe and effective LBP exposure reduction. For example, TSCA § 402(a) directs EPA to promulgate regulations requiring the certification of individuals engaged in LBP activities and accreditation of training programs for LBP activities. Further, § 406 mandates specific disclosure requirements to ensure that potential homeowners become aware of LBP hazards prior to undertaking renovation and remodeling activities. Title IV of TSCA also requires EPA involvement in establishing safe and effective standards for performing LBP abatement and deleading § 402(a)) identifying conditions indicative of LBP hazards (§ 403), preparing a model state regulatory program for LBP activities (§ 404), and a disclosure rule (§ 406) for homeowners and renovation and remodeling customers. Fully implemented, the combined efforts of HUD and EPA will establish guidelines and programs for efficiently and safely identifying, removing, and controlling LBP hazards in residential settings.

Congress	Lead-Based Paint Hazard Reduction Act		
HUD	Title X of the Housing and Community Act of 1992		
EPA	Adds Title IV, Lead Exposure Reduction, to TSCA		
	§ 402(a)	–	Certification and training of individuals engaged in LBP abatement activities
		S	Standards for conducting LBP activities
		S	Accreditation of LBP training programs
	§ 402(c)	–	Guidelines for conducting renovation and remodeling activities
		S	Application of 402(a) provisions to R&R activities creating LBP hazards
	§ 403	–	Identification and disclosure of LBP hazards
	§ 404	–	Model state program
		S	EPA authorization of state programs
	§ 406	–	Disclosure to homeowners and customers of renovation and remodeling projects
	§ 1018	–	Lead disclosure upon transfer of residential property

Figure 2-2. Lead hazard reduction activities initiated by the Lead-Based Paint Hazard Reduction Act.

To support mitigation of LBP hazards, HUD has established several sources of funding for abatements in public and low-income private housing. The HUD funds generally finance LBP abatement in public housing units, either as part of ongoing modernization activities or specifically to remove LBP sources from housing units inhabited by one or more children with elevated blood lead levels. Although HUD has published a comprehensive plan for the abatement of private housing units, HUD does not have the authority to mandate abatements in most privately owned structures.

In addition to the federal goals outlined by HUD, the activities of state and local organizations help determine regional and local abatement trends. The effectiveness of state and local laws depends on public awareness of LBP hazards and budget restrictions of the regulating agencies. As a result, some States, such as Maryland and Massachusetts, have relatively mature lead poisoning prevention programs that encourage extensive abatement activity in both public and private housing units, while other States only have emerging or no abatement programs. Some States and cities have encouraged private housing abatements by providing subsidies or tax breaks to certain housing owners. Summaries of State abatement legislation are provided in the references (EPA 1996a and 1996b; FR 1990).

To identify the housing units with potential LBP hazards, HUD has recommended two thresholds for defining LBP: (a) paint with a lead concentration greater than 0.5 percent by weight, or (b) painted surfaces having lead concentrations equal to or greater than 1.0 mg/cm^2 (HUD, 1990b). The actual concentration of lead in paint can be determined using several testing methods, including portable x-ray fluorescence (XRF) analyzers and atomic absorption spectrometry (AAS). According to HUD, the severity of the hazard may be further assessed by considering the condition of the painted surfaces, the age of the house,[2] the volume of lead in household dust, and the likelihood of children under the age of seven being present.

2.1.2 Baseline Number of Abatements

Baseline LBP abatement activity is based on estimates of abatement activity in ten States (EPA 2000).[3] Data for 1997-1999 were used for the estimates, since the data were most consistent among the States for these three years. Due to the exceptionally high abatement rate reported in Massachusetts relative to the other nine States, estimates were developed that both included and excluded Massachusetts data. The estimates were calculated using the following three steps: (1) the number of abatements per State for each of the three years were summed; (2) the number of

[2] The use of LBP in residential applications was banned in 1978, and prior to that year the paint industry had been decreasing the quantity of lead in paint, especially interior paint, since the 1950s (Dacquisto, 1996). Although anecdotal evidence exists that some manufacturers sold LBP out of inventories after 1978, and that some paint contractors added lead-based pigments to paint on their own, this evidence is impossible to quantify (Marchaterre, 1996).

[3] The ten States are: Connecticut, Maine, Massachusetts, Minnesota, Missouri, New Jersey, Ohio, Pennsylvania, Rhode Island, and Texas.

abatements from step 1 were divided by the number of pre-1978 housing units for the States included in the summation (yielding an average abatement rate) and (3) the abatement rates were multiplied by the national housing stock of pre-1978 housing units.

The calculations outlined above yield a national estimate (for all States) of 22,209 abatements in 1999, which represents a national abatement rate of 0.03 percent per year.[4] If Massachusetts is excluded from the calculations, the abatement rate drops to 0.01 percent per year, resulting in an estimate of 9,139 abatements for 1999. Table 2-1 shows the data from the ten States surveyed. The number of abatements was divided into the number of pre-1978 housing units in these States to estimate the 1999 abatement rate, which is based on all ten States, including Massachusetts. This rate, 0.03 percent per year, was extrapolated to the nation as a whole based on the number of pre-1978 housing units nationwide (65.9 million), as shown in Table 2-2.

Table 2-1. Recent Abatement Activity for Selected States

	Number of Abatements Reported		
State	**1997**	**1998**	**1999**
Connecticut	138	272	134
Massachusetts	4,999	4,447	3,946
Maine	N/A	53	45
Minnesota	N/A	N/A	230
Missouri	N/A	572	408
New Jersey	258	283	242
Ohio	354	427	466
Pennsylvania	N/A	N/A	261
Rhode Island	N/A	138	111
Texas	221	359	453
Total, Including MA data	**5,970**	**6,551**	**6,296**
Total, Not Including MA data	**971**	**2,104**	**2,350**

Source: EPA (2000)

[4] The estimated baseline number of abatements, 22,209, is lower than the estimate of 126,374 found in EPA 1998. The primary reason for this discrepancy is that the estimate in EPA 1998 was based on abatement activity from Massachusetts alone. As shown above, the abatement rate in Massachusetts is much higher than other States (0.19 percent for Massachusetts alone versus an average of 0.01 percent for the other nine States studied).

Table 2-2. National Annual LBP Abatement Activity Estimates (2000 data)

State(s)	Abatement Rate	Number of Pre-1978 Housing Units (millions)	Number of Abatements
All States	**0.03%**		**22,209**
All States, excluding MA	0.01%	65.9	9,139
Only MA	0.19%		149,784

Source: EPA 2000; HUD 2001.

Although no breakdown of abatements by type of housing unit (e.g., single-family versus multifamily) is available, this can be estimated based on the share of each housing unit type in the total population of housing units with LBP, using the most recent HUD data. Of the 37.9 million housing units with LBP anywhere, 89.9 percent were single-family units and 10.1 percent were multifamily units (HUD 2001). Using the same ratio, we estimate the baseline number of abatements in single-family housing units at 19,973 and the baseline number of abatements in multifamily housing units at 2,236 (see Table 2-3).

Table 2-3. Distribution of Abatements by Type of Housing Unit

Type of Housing Unit	Number of Housing Units with LBP (000)	Percent of Total	Estimated Annual Number of Abatements
Single family	34,081	89.9%	19,973
Multifamily	3,815	10.1%	2,236
TOTAL	**37,896**	**100.0%**	**22,209**

Source: EPA 2000; HUD 2001.

2.1.3 Estimated Quantities of Residential Abatement Waste Generated

Table 2-4 shows the estimated quantity of residential LBP waste generated per abatement activity for public and private housing units (both single- and multifamily). These estimates are based on actual waste amounts generated from abatements performed in public and private housing units (EPA 1995b).

Table 2-4. Amount of Residential LBP Waste Generated per Abatement Activity

Type of Structure	Average Square Footage of Structure	Amount of Residential LBP waste Generated per Abatement	
		Volume (yd^3)	Weight (tons)
Single-family housing (public)	1,065[a]	3.05[b]	**1.66**
Single-family housing (private)	1,775[a]	5.08[d]	**2.77[d]**
multifamily[c]	1,255[a]	3.59[d]	**1.96[d]**

Sources:
[a] EPA 1995b; EPA 1998.
[b] Based on waste generation in public housing abatements (EPA 1995b)
[c] Square footage and waste quantities for multifamily structures are per housing unit.
[d] Extrapolations from single-family public housing units based on relative square footage of the structures.

Since HUD's most recent analysis of lead hazards (HUD 2001) has not yet published estimates of the distribution of housing units with lead hazards by private and public ownership status, EPA uses the following residential LBP waste generation factors in this analysis:

- For single-family housing units, the average of the residential LBP waste generation rate for public and private single-family homes, i.e.,

  $(1.66 + 2.77) \div 2 = 2.22$ tons per unit, and
  $(3.05 + 5.08) \div 2 = 4.07$ cubic yards per unit.

- For multifamily units, 1.96 tons and 3.59 cubic yards per abatement.

As seen in Table 2-5, when these estimated residential LBP waste quantities per abatement are multiplied by the baseline number of abatements, the total quantity of LBP abatement waste being generated is estimated at 48,723 tons (89,317 cubic yards). For purposes of cost estimation in Chapter Four, we also calculate the weighted average quantity of residential LBP waste generated, which is obtained by dividing the total tons and cubic yards by 22,209, which is the baseline number of abatements. For all abatements, the average quantity of residential LBP waste generated is estimated at 2.19 tons per housing unit.

Table 2-5. Baseline Estimates of Residential LBP Waste Generated by Abatement Activities (annual)

Baseline number of abatements	Single-Family Units	Multifamily Units	All Housing Units
Number of abatements	19,973	2,236	22,209
Average quantity of residential LBP waste per abatement			
tons	2.22	1.96	--
cubic yards	4.07	3.59	--
Baseline residential LBP waste generation			
tons	44,340	4,383	48,723
cubic yards	81,290	8,027	89,317
Weighted average residential LBP waste generation			
tons	--	--	2.19
cubic yards	--	--	4.02

Sources: EPA 2000; EPA 1998.

2.1.4 Affected Entities and Employees

Information characterizing the LBP abatement industry is difficult to obtain because of the lack of any uniform contractor licensing or registration system for the industry. While a new industry code, NAICS 56291 (Remediation Services)[5] captures establishments dedicated to LBP abatement activities, it is likely that establishments classified in NAICS 23 (Construction) also perform abatement work, either in the course of normal construction and remodeling activities, or as a secondary activity. Table 2-6 lists 1997 establishment and employment data for the five-digit NAICS codes that may include potentially affected entities.

[5] The Census definition for this industry is as follows:

562910 Remediation Services—This industry comprises establishments primarily engaged in one or more of the following: (1) remediation and cleanup of contaminated buildings, mine sites, soil, or ground water; (2) integrated mine reclamation activities, including demolition, soil remediation, waste water treatment, hazardous material removal, contouring land, and revegetation; and (3) asbestos, **lead paint**, and other toxic material abatement.
Source: http://www.census.gov/epcd/naics/NDEF562.HTM

Table 2-6 Number of Establishments and Employment in Industries That May Perform LBP Abatement Work

NAICS Code	Description	Number of Establishments	Total Number of Employees	Total Number of Construction Employees	Average Number of Employees per Establishment	Average Number of Construction Employees per Establishment
23321	Single-Family Housing Contractor	138,850	570,990	367,719	4.1	2.6
23322	Multifamily Housing Contractors	7,540	58,896	40,082	7.8	5.3
23332	Commercial and Institutional Contractors	37,430	528,173	359,981	14.1	9.6
23521	Painting and Wallcovering Contractors	37,480	195,331	160,740	5.2	4.3
23542	Drywall, Plastering, Acoustical, and Insulation	20,457	266,710	229,934	13.0	11.2
23551	Carpentry Contractors	44,858	230,409	185,610	5.1	4.1
23552	Floor Laying & Other Floor Contractors	12,078	60,533	42,663	5.0	3.5
23599	All Other Special Trades	25,932	198,141	146,894	7.6	5.7
56291	Remediation Services	1,677	40,994	NA	24.4	NA
Totals		**326,302**	**2,150,177**	**1,533,623**	**6.6**	**4.7**

Note: the number of establishments that perform residential LBP abatement in these industries is unknown.
Source: Census 2000a.

The industries that may include establishments performing LBP abatement work encompass 326,302 establishments, and these establishments employ a total of 2.15 million workers. The overall average number of employees per establishment is 6.6.

2.2 Renovation and Remodeling

This section focuses on the renovation and remodeling (R&R) industry and specifically on R&R activities that have the potential to generate residential LBP waste. The focus of the Direct Final Rule is on residential R&R activities, so this section will only provide estimates for residential R&R activities and will exclude nonresidential R&R activities.

2.2.1 Renovation and Remodeling Activities Generating Residential LBP waste

Depending on the nature of the project, some R&R projects undertaken may disturb LBP or otherwise generate residential LBP waste. For this analysis the following categories of residential R&R activities are assumed to have such potential:

- Construction of additions
- Kitchen remodeling or addition
- Bathroom remodeling or addition
- Window replacement

These activities were selected because of the likelihood for major disruption of surfaces containing LBP and for generation of residential LBP waste. This list was developed following review of a comprehensive categorization of R&R activities by building industry experts (EPA 1998). The list excludes a number of R&R activities that disturb LBP only infrequently as well as other activities that may disturb LBP but generate little if any residential LBP waste (e.g., remodeling of rooms other than kitchens and bathrooms, siding replacement, roof maintenance and replacement, insulation). An unknown (but likely small) amount of additional residential LBP waste may be generated by activities not included in the list above.

2.2.2 Potential Overlap Between Renovation and Remodeling and Abatement

The baseline number of abatements conducted in the U.S. was obtained by applying the abatement rate calculated for ten States, based on confirmed abatement activity in those States, to the national stock of pre-1978 housing units containing interior LBP. The baseline number of R&R activities that may generate residential LBP waste is derived from national surveys of home improvement activity. This section considers the possibility that specific types of projects may be counted as both R&R activities and abatements, which may lead to some double counting of activities.

Double counting is likely to arise if an activity identified in the list above could also be reported as an abatement. Based on the R&R activities considered in this analysis, EPA believes that window replacement projects have the greatest potential for overlap, because window replacement is both a common R&R activity and a common abatement activity. To account for this, EPA assumes that *all* abatements involve window replacement The remaining R&R activities (additions, kitchen remodeling/addition, bathroom remodeling/addition) are unlikely to generate sufficient residential LBP waste to be also reported as abatements. The section below adjusts the estimate of window replacement activity to account for potential double counting.

2.2.3 Baseline Number of Renovation and Remodeling Activities

Data from the American Housing Survey (AHS) provide estimates of the number of additions and remodeling projects for owner-occupied housing over a two-year period. The most recent estimates available cover 1996 and 1997. EPA first multiplied the AHS figures by 0.5 to obtain an annual estimate of R&R activities in owner-occupied housing units. Additions and remodeling projects conducted in rental units are not reported in the AHS, therefore the AHS estimates must be adjusted to account for such activities in rental units. This adjustment is accomplished by applying data from *Current Construction Reports* (C50) (Census 2001b), which indicates that in 1997 expenditures in rental units were 20.9 percent of expenditures in owner-occupied units. Rental unit expenditures for kitchen and bathroom remodeling and additions represented 19.1 percent of owner-occupied expenditure, while rental unit expenditures for window and door replacement represented 44.0 percent of owner-occupied expenditures.[6]

Since the AHS estimates cover all housing units, not just residential housing units with LBP, the number of R&R activities was also multiplied by 0.624, which is the share of housing units reporting some R&R expenditure that are pre-1980 housing units (Census 2000b).[7] This figure was further adjusted by a factor of 0.383, which represents the share of all pre-1978 housing units with exterior LBP.[8] The exterior LBP frequency is used instead of interior LBP frequency because R&R activities are likely to disturb a larger portion of exterior surfaces than in the course of abatement activities. To

[6] Data for window replacements, excluding door replacements, is not available from AHS; therefore data for window and door replacements combined is used. Use of this combined data may result in an overestimate of window replacement activity.

[7] AHS reports R&R expenditures for pre-1980 housing units, not pre-1978 housing units. Therefore the data for pre-1980 housing units had to be used in place of data for pre-1978 units.

[8] This adjustment factor was derived from the share of pre-1978 single-family and multifamily units with exterior LBP, reported in EPA 2001. Exterior LBP is found on 47.6 percent of single-family units and 16.6 percent of multifamily units. The 70:30 ratio of single-family to multifamily units was used to calculate the (weighted average) exterior LBP frequency for the entire pre-1978 housing stock, i.e., [(0.899 * 0.476) + (0.101 * 0.166)] = 0.445

compensate for this difference, the *interior* LBP frequency is used in the estimation of abatement activities while the *exterior* LBP frequency is used in estimating R&R activities.

Table 2-7 summarizes the baseline estimates of R&R activities. Based on the data sources cited above and the adjustments noted in the text, the baseline number of R&R activities estimated to generate residential LBP waste are as follows: additions (662,534), kitchen remodels (1,552,220), bathroom remodels (2,102,863), and window replacements (1,136,132).

Table 2-7. Derivation of Baseline Number of R&R Activities (annual)

R&R Activity	Calculation (see text)[a]	Baseline Estimate	Primary Data Source
Additions	3.947 million x 0.5 x 1.209 x 0.624 x 0.445	662,534	Census 2001a
Kitchen remodels	9.387 million x 0.5 x 1.191 x 0.624 x 0.445	1,552,220	Census 2001a
Bathroom remodels	12.717 million x 0.5 x 1.191 x 0.624 x 0.445	2,102,863	Census 2001a
Window replacements (housing units)	7.153 million x 0.5 x 1.144 x 0.624 x 0.445	1,136,132	Census 2001a
less: abatements involving window replacement	100% of abatements in target housing	22,209	EPA 2000
equals: Window replacement as an R&R activity		1,113,923	

[a] Explanation of calculations—For additions, 3.9 million is the two-year (1996 and 1997) estimate of the number of additions. This is multiplied by 0.5 to obtain a single-year estimate, by 1.209 to account for additions in rental units, by 0.624 to account for units built before 1980, and by 0.445 to account for the share of units that contain exterior LBP.
Note: Figures may not add to totals due to rounding.

2.2.4 Estimated Quantities of Annual Residential R&R Waste Generated

Estimates of the quantities of residential LBP waste generated from R&R activities are limited for a number of reasons. First, R&R activities are heterogeneous, ranging from minor renovations to major remodeling projects. Second, most projects generate two waste streams, consisting of "clean" construction wastes (leftover wood, drywall, etc.) and demolition wastes removed from the existing structure. Often both types of waste are consolidated into one dumpster for disposal.

Table 2-8 shows estimates of the total quantity of waste associated with various R&R activities. These range from 0.19 tons for room additions to 2.3 tons for kitchen remodels. The total estimated

quantity of debris generated is 4.59 million tons . To identify the quantities of waste likely to contain LBP, EPA has relied on a 1990 study (HUD 1990a) that measured the amount of LBP-containing surfaces in a sample of 284 pre-1980 homes. Total surface area covered with LBP for each of these architectural components was then estimated on a national level for all privately owned, occupied housing units undergoing some R&R activities. The same process was used to estimate LBP surface area on exterior components. The analysis then estimated the amount of waste generated by each of the four R&R activities outlined above (additions, kitchen remodels, bathroom remodels, and window replacements). These figures were then multiplied by the baseline number of R&R activities to produce an estimate of the total amount of residential LBP waste generated. Table 2-8 indicates that R&R activities generate an estimated 985,994 tons of LBP waste per year.

Table 2-8. Baseline Annual Estimates of Residential LBP Waste Generated Annually from R&R (tons)

Type of R&R Activity	Baseline Number of Affected Activities	Average Waste per R&R Activity (tons)		Total Quantity of R&R Waste (tons per year)	
		Total Waste	LBP Waste	Total Waste	LBP Waste
Construction of additions	662,534	0.19	0.08	125,881	53,003
Remodeling of kitchens	1,552,220	2.30	0.20	3,570,106	310,444
Remodeling of bathrooms	2,102,863	0.19	0.01	399,544	21,029
Replacement of windows	1,113,923	0.45	0.54	501,265	601,518
Totals	**5,431,540**			**4,596,797**	**985,994**

Source: Average quantity of waste per activity and LBP waste per activity was estimated in EPA 1998. Baseline number of activities were estimated above. Totals may not add due to rounding.

2.2.5 Affected Entities and Employees

Estimates of the number of establishments and employees potentially engaged in R&R activities that generate residential LBP waste are based on a recent study published by the Joint Center for Housing Studies at Harvard University. The report, *Remodeling Homes for Changing Households* (Joint Center 2001), provides updated national estimates of the number of residential remodeling establishments. The estimates are based on analysis of receipts data for construction establishments, to identify establishments for which a majority of receipts are obtained from renovation and remodeling activities (as opposed to, for example, construction activities). Table 2-9 presents the study's findings.

Table 2-9 Estimates of the Number of Residential Construction and Remodeling Establishments (1997)

Industry	Number[1] (thousands)	Value of Construction Receipts ($Mil)	Value of Remodeling Receipts ($Mil)
General Building Construction			
General Building Contractors: Residential	62.4	$26,874	$22,958
Special Trades			
Plumbing, Heating, and AC	32.0	$13,046	$9,495
Painting and Paper Hanging	16.8	$3,021	$2,460
Electrical Work	11.5	$2,773	$1,867
Masonry, Stone Work, Tile Setting, and Plastering	6.6	$1,761	$1,302
Carpentry and Floor Work	18.3	$5,435	$4,398
Roofing, Siding, and Sheet Metal Work	15.1	$6,075	$5,097
Concrete Work	2.0	$661	$513
Water Well Drilling	0.3	$84	$55
Miscellaneous	6.6	$2,465	$1,968
Total Special Trade	109.1	$35,321	$27,155
Total R&R Contractors	**171.5**	**$62,195**	**$50,113**

[1] With more than 50% of receipts from remodeling.
Source: Joint Center (2001)

According to the Harvard study, a total of 171,500 residential R&R establishments in the United States earn more than 50 percent of receipts from remodeling and renovation activities. These establishments are found in both the general building construction industry (62,400 establishments or 36.4 percent of the total) as well as various special trades. These include large numbers of: plumbing, heating and air conditioning contractors (32,000 establishments), painting and paper hanging contractors (16,800 establishments), carpentry and floor work contractors (18,300 establishments), and roofing, siding and sheet metal contractors (15,100 establishments). EPA believes that all of these establishments may be potentially affected by the Direct Final Rule.

2.3 Residential LBP Waste Transportation

OSW's July 2000 policy statement (Cotsworth 2000) clarified that residential LBP waste generated from residential activities is no longer a hazardous waste, and as such, it can be "discarded in a municipal solid waste landfill (MSWLF) or a municipal solid waste combustor." (Cotsworth 2000). The Direct Final Rule clarifies that such waste can also be disposed of in C&D landfills. As far as the transportation industry is concerned, this action will not affect the number of transporters hauling residential LBP waste, but it may affect hauling patterns as the waste by changing the patterns of hauling to C&D landfills and MSWLFs.

The following NAICS industries may potentially be affected this action:

- General Freight Trucking, Local (NAICS 48411)
- General Freight Trucking, Long-Distance (NAICS 48412)
- Solid Waste Collection (NAICS 562111)
- Other Waste Collection (NAICS 562119)

Table 2-10 shows 1997 establishment and employment data for potentially affected by this action.

Table 2-10 Number of Establishments and Employment in Industries That May Haul Residential LBP Waste

NAICS Code	Definition	Establishments	Number of Employees	Average Number of Employees per Establishment
48411	General Freight Trucking, Local	15,460	134,777	8.7
48412	General Freight Trucking, Long-Distance	29,321	684,730	23.4
562111	Solid Waste Collection	7,083	137,049	19.3
562119	Other Waste Collection	827	7,227	8.7
Totals		**52,691**	**963,783**	**18.3**

Source: Census 2000a.

2.4 Residential LBP Waste Disposal

As a result of the July 2000 policy statement (Cotsworth 2000), residential LBP waste is classified as a household waste and thus can be disposed of in a permitted MSW landfill. Under

section 258.2, a C&D landfill that receives residential LBP waste could be deemed to be receiving household waste and may need to comply with EPA's Municipal Solid Waste Landfill Criteria found in 40 CFR part 258. The Direct Final rule is designed to expressly state that C&D landfills can receive residential LBP waste, as long as that is the only household waste they accept, without becoming subject to the requirements for a MSWLF in part 258. Therefore, potentially economically affected disposal facilities include both MSWLFs and C&D landfills. The Direct Final Rule will likely shift waste from MSWLFs to C&D landfills, where economically advantageous.

Table 2-11 shows State-by State data on the number of C&D landfills and MSWLFs, as reported in the solid waste industry publication *BioCycle*. Although the most recent national total reported for C&D landfills is 1,860 (in 1999), the State-by-State estimates, compiled by *BioCycle* for 1999 and previous years, sum to 2,117. The number of MSWLFs in 1999 was estimated to be 2,216. The potential impact of the rule would be to shift disposal from some MSWLFs to C&D landfills.

2.4.1 Availability of C&D Landfill Capacity

The *number* of C&D landfills has fluctuated since 1997, when BioCycle first included a count of C&D landfills in their annual report. In 1997, BioCycle reported there were 1,000 C&D landfills nationwide. The next year, 1998, BioCycle reported that the number of C&D landfills had increased to 1,334, and it increased again in 1999, to 1,860 landfills. In the most recent issue for 2000, BioCycle reports an increase in the number of C&D landfills, to 2,117. EPA has previously noted a decrease in the number of C&D landfills over the 1986 to 1994 period, from 2,500 landfills in 1986 to 1,800 landfills in 1994 (EPA 1995c). Table 2-12 shows the distribution of States by number of C&D landfills, based on the latest BioCycle report. As seen here, 15 States have 10 or fewer C&D landfills. Two States (RI and DC) have no C&D landfills, three States (DE, NJ, NH) have one C&D landfill, and eight States have between two and five C&D landfills (WY, NV, CO, HI, OK, AK, MO, PA).

During the 1997-2000 period, based on a review of data reported in BioCycle, seven States reported a decrease in the number of C&D landfills (AK, AZ, FL, MD, NJ, NY, OH). Over the same period, 13 States reported an increase in C&D landfills (KS, ME, MA, MS, NC, ND, SC, SD, TN, TX, WA, WV, WI). In most other States reporting to the BioCycle survey, the number of C&D landfills remained fairly steady from 1997-2000.

Table 2-11. Estimated Number of C&D Landfills and MSWLFs, by State (1999)

State	C&D Landfills [a]	MSW Landfills
Alabama	89	29
Alaska	4	239
Arizona	6	47
Arkansas	32	23
California	450 [c]	184
Colorado	2	115
Connecticut	40	1
Delaware	1	3
Dist. of Columbia	0	0
Florida	158	57
Georgia	32	70
Hawaii	3	10
Idaho	n/a	29
Illinois	0 [b]	58
Indiana	11	37
Iowa	13	61
Kansas	111	54
Kentucky	25	35
Louisiana	54 [c]	23
Maine	29	8
Maryland	12	22
Massachusetts	19	43
Michigan	31	53
Minnesota	79	22
Mississippi	63	19
Missouri	4	26
Montana	2 [c]	33
Nebraska	14	24
Nevada	2	26
New Hampshire	1	4
New Jersey	1	12
New Mexico	11 [d]	77
New York	23	28
North Carolina	52	39
North Dakota	50+	14
Ohio	76	49
Oklahoma	4	41
Oregon	6	29
Pennsylvania	5	49
Rhode Island	0	4
South Carolina	152	19
South Dakota	172	15
Tennessee	65	51
Texas	47	184
Utah	39	36
Vermont	1 [c]	5
Virginia	24	65

Table 2-11. Estimated Number of C&D Landfills and MSWLFs, by State (1999)

State	C&D Landfills [a]	MSW Landfills
Washington	31	21
West Virginia	29	19
Wisconsin	40	46
Wyoming	2	58
Total	**2,117 [e]**	**2,216**

Notes:

[a] Data are as reported for 1999, unless otherwise noted

[b] 1998, 1996

[c] 1998

[d] 1998. 1997

[e] The sum of entries is higher than total reported (1,860) for 1999 due to the inclusion of figures from years other than 1999 in order to provide the most comprehensive data available.

Sources: BioCycle (April issue, 2000).

Table 2-12. Distribution of States by Number of C&D Landfills, 2000

Number of C&D Landfills	Number of States	Percent of Total
0-10	15	34.1%
11-20	5	11.4%
21-30	4	9.1%
31-40	7	15.9%
41-50	2	4.5%
51-75	4	9.1%
76-100	3	6.8%
101-150	1	2.3%
150+	3	6.8%
TOTAL	**44**	**100.0%**

Source: BioCycle April 2000

2.4.2 Availability of MSW Landfill Capacity

In 1988, the first year of the BioCycle reports, there were around 8,000 MSWLFs reported. The most recent report puts the number at 2,216. That is a decline of almost 6,000 landfills in twelve years. While the number of landfills nationally has shrunk considerably in recent years, the total capacity of those landfills that remain open has remained constant or in some cases increased. This seeming contradiction is a result of the closure of many smaller landfills combined with the opening or expansion of large regional landfills.

Table 2-13 shows the distribution of States by remaining MSW landfill capacity. As shown, while 10 States report 10 or fewer years of MSW disposal capacity remaining, another seven report between 11 and 15 years remaining and 15 States report more than 20 years of capacity. Table 2-14 identifies eight of the ten States that report 10 years or less of remaining landfill capacity, and the reported remaining capacity for each.

Table 2-13. Distribution of States by Remaining MSW Landfill Capacity (Years)

Capacity Remaining (Number of years)	Number of States	Percent of Total
0-5	1	2.9%
6-10	9	26.5%
11-15	7	20.6%
16-20	2	5.9%
20+	5	14.7%
30+	4	11.8%
40+	2	5.9%
50+	3	8.8%
500+	1	2.9%
Total	**34**	**100.0%**

Source: BioCycle 2000. Not all states are included in this distribution..

Table 2-14. States Reporting Less Than Ten Years of Remaining MSW Disposal Capacity

State	Remaining Capacity (years)
Maine	7-10
Massachusetts	1.8
Minnesota	7.5
Missouri	5-10
New Hampshire	10
Rhode Island	10
Tennessee	5-10
Wisconsin	6+

Source: BioCycle, April 2000

2.5 State and Territorial Governments

The 40 CFR Part 257 and 258 regulations being amended by the Direct Final Rule are implemented by States and territories who have received EPA approval of their RCRA Subtitle D programs. As of March 1, 2000, 49 States and territories had received approval of their programs. Because the Direct Final Rule is less stringent than existing federal criteria, States are not required to amend permit programs which have been determined to be adequate under 40 CFR Part 239. States have the option to amend statutory or regulatory definitions pursuant to the Direct Final Rule. If a State chooses to amend its permit program pursuant to the Direct Final Rule, the State must notify the Regional Administrator of the modification as provided by 40 CFR 239.12. The Direct Final Rule is directly applicable to landfills in States without an approved permit program under Part 239.

CHAPTER THREE

DESCRIPTION OF THE DIRECT FINAL RULE

3.1 Regulatory Background

On December 18, 1998, EPA published a proposed rule suspending the Toxicity Characteristic (TC) Rule (40 CFR 261.24) for LBP debris (63 FR 70233). The proposed rule would exempt *LBP debris* from the hazardous waste requirements of RCRA Subtitle C. Concurrent with this action, EPA published a proposed rule under TSCA that would introduce new standards for management and disposal of LBP debris (63 FR 70190). The companion TSCA rulemaking was designed to ensure that certain precautions were taken to minimize the potential for exposure to LBP debris during storage and transport.

By suspending the TC Rule for LBP debris, the proposed rule would exempt generators of such waste from requirements to test the waste to determine whether it exhibits the TC for lead (i.e., determine whether it is a hazardous waste). If found to be a hazardous waste, the debris previously would have had to be transported as a hazardous waste and disposed of in a hazardous waste disposal facility. These testing, transport and disposal requirements substantially increase the costs of managing LBP debris, and were found by EPA to be an impediment to further lead abatement activities that could reduce harmful exposures to lead.

On July 31, 2000, EPA's Office of Solid Waste issued a policy statement (Cotsworth 2000) clarifying the regulatory status of *LBP waste*[9] generated in homes and other residences. The policy allows contractors who generate LBP waste from "residential abatement, renovation and remodeling, and rehabilitation activities" to dispose of the waste as *household waste* in municipal solid waste landfills or municipal solid waste combustors according to State and local requirements [italics added].

3.2 Justification for the Direct Final Rule

The July 2000 policy statement classifies residential LBP waste as a household waste and states that, as such, it can be "discarded in a municipal solid waste landfill (MSWLF) or a municipal solid waste combustor." (Cotsworth 2000). As a result, any C&D landfills that accept residential LBP waste following issuance of this policy statement could be deemed to be receiving household waste and may need to comply with EPA's Municipal Solid Waste Landfill Criteria found in 40 CFR part 258.

[9] The July 2000 policy clarification states that LBP waste includes "...debris, paint chips, dust, and sludges generated from abatement and deleading activities." (Cotsworth 2000).

These criteria establish minimum national performance standards necessary to ensure that "no reasonable probability of adverse effects on health or the environment" will result from solid waste disposal facilities (40 CFR Part 258). Compliance with these criteria would be costly for C&D landfills.

The intent of the Direct Final Rule is to allow residential LBP waste to be disposed of in both MSWLFs and in C&D landfills. The rule would do so by amending the definition of a MSWLF unit and by adding definitions for construction and demolition (C&D) landfill and residential lead-based paint waste (see page 1 of this document). Under the revised and additional definitions, any C&D landfill that accepts residential lead-based paint waste *and no other household waste* is not a MSWLF unit and therefore not subject to the Part 258 criteria. This would allow disposal of residential LBP waste in C&D landfills.

This regulatory change has several impacts. First, it provides additional flexibility to States and territories for managing their solid waste streams. The Direct Final Rule offers States the option to authorize disposal of residential LBP waste in C&D landfills. The second result of the Direct Final Rule will be to provide an opportunity for residential LBP waste generators to save money, in cases where the cost of disposing of such waste in C&D landfills is below the cost of disposing of the waste in MSWLFs. The relative costs of disposal in C&D landfills and MSWLFs and the magnitude of the potential annual cost savings are discussed in Chapter Four.

Finally, to the extent that costs for disposing of residential LBP waste are reduced as a result of this action, it may lead to an increase in the level of LBP hazard abatement activity. As shown in Chapter Four, this is expected to have the most impact in the public housing sector, where public housing authorities are most likely to use the savings from reduced residential LBP waste management costs to perform additional LBP hazard reduction activities, including abatements. Thus, the rule may have the effect of further reducing the exposure of sensitive populations, particularly children, to the effects of LBP. The hazards of lead exposure are well-understood and include decreased intelligence (lower IQ), behavioral problems, reduced physical stature and growth, and impaired hearing (Task Force 2000).

CHAPTER FOUR

COST ANALYSIS

The Direct Final Rule will impose no additional costs but may result in cost savings and incremental public health benefits. This chapter presents estimates of the magnitude of the savings that will result from this action, and identifies the sectors most likely to benefit.

The Direct Final Rule will expressly allow C&D landfills to receive residential LBP waste without becoming subject to the requirements for a MSWLF in part. As a result, EPA believes that in those parts of the country where it is cheaper to transport and dispose of residential LBP waste in C&D landfills compared to MSWLFs, some residential LBP waste will be diverted from MSWLFs to C&D landfills. Where this occurs, generators will benefit from lower waste management and disposal costs. Residential LBP waste transporters will continue to transport residential LBP waste for disposal, except disposal will take place at C&D landfills, as opposed to MSWLFs. Some MSW landfill operators will experience a reduction in demand for disposal services, which will be offset by an increase in demand for disposal services at C&D landfills. This section presents current data on the relative costs of transportation and disposal to C&D landfills and MSWLFs.

4.1 Cost of Residential LBP Waste Transportation

Specific data on the costs of transporting residential LBP waste is not readily available. The R.S. Means Co. (Means 2000), publishers of data that is widely used in the construction industry, reports costs for contractors hauling *rubbish* of:

- $0.71 per mile for loads up to 8 cubic yards and
- $0.53 per mile for loads over 8 cubic yards in size (which require a larger truck).

EPA believes that these costs reasonably represent the costs of hauling waste generated by residential LBP abatements and renovation and remodeling activities.

To estimate the typical haul length to MSWLFs and C&D landfills, EPA used the following approach. In 1995, EPA estimated that the average haul length to MSWLFs was 28 miles (EPA 1995a). As shown in Chapter Three, the number of MSWLFs has decreased dramatically in recent years. In 1994, there were an estimated 4,482 MSWLFs in operation (EPA 1995a), but more recent industry estimates suggest there are presently 2,216 MSWLFs in operation (BioCycle 2000). If we assume that the average haul distance to MSWLFs has increased in proportion to the decrease in the number of MSWLFs, the estimated average haul distance to MSWLFs in 2000 can be calculated as follows:

eq1. haul distance to MSWLFs in 2000
= haul distance in 1995 x ($MSWLF_{1995}$ / $MSWLF_{2000}$)
= 28 x (4,482 / 2,216)
= 56.6 miles

To estimate the average haul distance to C&D landfills, we can adjust the MSWLF haul distance by the ratio of the number of C&D landfills to MSWLFs using the same approach as EPA (1995a):

eq2. haul distance to C&D landfills in 2000
= 56.6 x ($MSWLF_{2000}$ / $C\&DLF_{2000}$)
= 56.6 x (2,216 / 2,117)
= 59.2 miles

The updated cost to transport residential LBP waste to C&D landfills is obtained by multiplying current (2000) costs of $0.71 per mile for loads under 8 cubic yards by the average haul of 59.2 miles, for a cost of $42.03 per load. The cost to transport residential LBP waste to MSWLFs is obtained by multiplying the cost per mile ($0.71) for trucks under 8 cubic yards by the haul distance of 56.6 miles. This yields a cost of $40.19 per load (see Tables 2-4 and 2-8). Since the average abatement and R&R project generates less than 8 cubic yard of waste, the cost per load can serve as an estimate of the cost of waste transportation per activity. Table 4-1 summarizes these estimates.

Table 4-1. Haul Distance and Transportation Cost for Residential LBP Waste

Type of Landfill	Average Haul Distance (miles)	Cost per mile (loads under 8 yd^3)	Cost
MSW landfill	56.6	$0.71	$40.19
C&D landfill	59.2		$42.03

Sources: EPA 1995a; Biocycle 2000; Means 2000.

4.2 Cost of Residential LBP Waste Disposal

4.2.1 Disposal to MSW Landfills

Nationally, two sources report similar weighted average tipping fees at MSWLFs across the United States. BioCycle (2000) reports an overall estimate of $35.57 per ton while Chartwell (2000) reports an estimate of $37.11 per ton. Regional differences, however, are seen in the Chartwell data, shown below in Table 4-2. Tip fees for MSWLFs range from a low of $20.88 per ton in the West to a high of $59.60 per ton in the Northeast. Table 4-2 also applies these costs to the average amount of residential LBP waste generated from residential abatements, 2.19 tons, which is used to represent the average quantity of waste disposed from residential LBP activities.[10] Disposal costs for this quantity of waste range from $45.73 in the West to $130.52 in the Northeast, with an average of $81.27 nationally.

Table 4-2. Tip Fees for Municipal Solid Waste Landfills

Region	Tip Fee, $/ton (April 2000)	Disposal Cost for Average Waste Quantity (2.19 tons)
Midwest	$33.88	$74.20
Northeast	$59.60	$130.52
South	$34.44	$75.42
West	$20.88	$45.73
National Average	**$37.11**	**$81.27**

Source: Chartwell (2000)

4.2.2 Disposal to C&D Landfills

Disposal fees at C&D landfills are estimated using the regional fees reported in EPA 1998. The tip fees (updated from 1998 to 2000 dollars) range from $21.19 in the Midwest to $49.49 in the Northeast, with a national average of $26.03 (see Table 4-3), Total disposal costs assuming the

[10] The quantities of waste to be disposed will vary considerably depending on the size of the abatement project or renovation and remodeling activity. The 1998 economic analysis (EPA 1998) estimated that abatements could generate between 1.6 and 2.8 tons per housing unit, and renovation and remodeling activities could generate between 0.2 and 2.3 tons each. In this analysis we use the figure of 2.19 tons per activity—the average for residential abatements—to determine the relative costs of disposal for MSW and C&D landfills. The costs for each option, and the relative costs, could vary depending on the quantity of waste to be disposed.

average volume of residential abatement waste range from $46.41 in the Midwest to $108.38 in the Northeast.

Table 4-3. Tip Fees for Construction and Demolition Landfills

Region	Tip Fee, $/ton ($1997)	Tip Fee, $/ton ($2000)[a]	Disposal Cost for Average Waste Quantity (2.19 tons)
Midwest	$19.70	$21.19	$46.41
Northeast	$46.00	$49.49	$108.38
South	$27.10	$29.15	$63.84
West	$42.60	$45.83	$100.37
National Average	**$24.20**	**$26.03**	**$57.01**

[a] Data from 1997 were inflated by adjusting by the Bureau of Labor Statistics' Producer Price Index for motor freight transportation (1997 = 102.9; 2000 = 110.7)
Source: Bush et al. (1997)

As seen in these two tables, tip fees at MSWLFs are generally higher than at C&D landfills The exception to this is the Western portion of the U.S., where the tip fees at MSWLFs are actually significantly below those for C&D landfills in the region (e.g., $20.88 per ton for MSWLFs compared to $45.83 per ton for C&D landfills).

4.3 Residential LBP Waste Transport and Disposal Cost

The data and calculations above were used to develop current (2000) estimates of the cost of transporting and disposing of residential LBP waste in C&D landfills and MSWLFs. Since some of the cost equations are dependant on the quantity of waste being disposed, this analysis assumes 2.19 tons of waste, as this represents the weighted average quantity of residential LBP waste generated during LBP abatements (see Table 2-5)

Table 4-4 compares the combined costs of transportation and disposal for C&D landfills and MSW landfills. The transportation costs reflect estimated differences in haul distance to each type of facility, and have been estimated using the method described above. The tip fees reflect regional differences in rates charged at C&D landfills and MSWLFs in various parts of the country.

These data suggest that when national-level costs are used, at least, the costs for hauling and disposing of residential LBP waste in a C&D landfill will typically be lower, by about 18 percent. For an average amount of residential LBP waste, the cost of hauling and disposing of the waste in a C&D

landfill would be $99.04 which is $22.38 below the $121.46 it would cost to haul and dispose of the waste in a MSW landfill.

Table 4-4. Average Transportation and Disposal Cost for Residential LBP Waste (2000) [a]

Disposal Location	Transportation	Tip Fees	Total Cost
MSW landfill	$40.19	$81.27	$121.46
C&D landfill	$42.03	$57.01	$99.04
Cost differential for C&D landfill	$1.84	($24.26)	($22.42)
Percent	4.6%	-29.9%	-18.5%

[a] Assumes average waste volume of 2.19 tons or 4.02 cubic yards (see Table 2-5).

As noted, the tip fees shown in Table 4-4 are based on *national* average cost data. These costs, however, do vary considerably by region, as evidenced by Tables 4-2 and 4-3. When the national-level transportation costs are combined with the regional disposal costs, as in Table 4-5 below, some regional differences between MSW landfill and C&D landfill disposal costs can be seen. For example, costs for disposal to C&D landfills are lower than costs for disposal to MSW landfills in the Midwest, Northeast, and South (by $25.95, $20.30, and $9.74 respectively), and higher in the West region (by $56.48).

Table 4-5. Regional Differences in the Cost of Disposal of Residential LBP Waste from Abatement[a]

Disposal Location	Transportation	Tip Fees	Total Cost
MSW Landfill			
Midwest	$40.19	$74.20	$114.39
Northeast		$130.52	$170.71
South		$75.42	$115.61
West		$45.73	$85.92
C&D landfill			
Midwest	$42.03	$46.41	$88.44
Northeast		$108.38	$150.41
South		$63.84	$105.87
West		$100.37	$142.40

[a] Assumes average residential LBP abatement waste volume of 2.19 tons (EPA 1998).

HUD's most recent survey of LBP hazards suggests that the Northeast, Midwest, and South regions combined contain, proportionately, slightly more of the housing stock with LBP. These regions combined account for 80.3 percent of all housing units but 84.4 percent of housing units with LBP nationwide (see Table 4-6). These data suggest a majority of generators of residential LBP waste will be located in regions where transport and disposal to C&D landfills is less expensive than transport and disposal to MSW landfills, and hence may benefit from the flexibility provided by the Direct Final Rule to dispose of residential LBP waste in C&D landfills.

Table 4-6. Regional Distribution of Housing Units with LBP

Region	All Housing Units		Housing Units with LBP	
	Number of Units ('000)	Percent of Total	Number of Units ('000)	Percent of Total
Midwest	22,083	23.1%	11,748	31.0%
Northeast	19,290	20.2%	10,600	28.0%
South	35,474	37.1%	9,607	25.4%
West	18,841	19.7%	5,942	15.7%
Total	**95,688**	**100.0%**	**37,897**	**100.0%**

Source: HUD 2001. Shaded rows identify regions where total disposal cost for C&D landfills is below cost for MSW landfills.

These regional cost comparisons are based on national estimates of transportation cost, which in turn are based on national estimates of waste hauling distances. The average haul distance to MSW landfills is estimated at 56.6 miles while the average haul distance to C&D landfills is estimated at 59.2 miles (see Section 4.1 above). Regional differences in these relative distances could influence relative transportation costs and hence relative total disposal costs,[11] but no attempt has been made to adjust for these differences. In addition, the relative costs will vary depending on the quantity of the waste to be disposed. While the transportation cost is fixed for loads under 8 cubic yards, the disposal cost is based on the weight of the load. The cost comparisons shown above are based on a load of 2.19 tons, which is the average quantity of waste generated by residential abatements.

Table 4-7 combines estimates of the national quantities of residential LBP waste generated by abatement and R&R activities with national-level estimates of waste hauling and disposal costs. As seen, if all residential LBP waste was currently being disposed in MSWLFs and the national average cost of hauling and disposal to MSW landfills (from Table 4-4) is $121.46 per ton, the baseline cost of residential LBP waste management would be $125.68 million per year. If, as a result of the Direct Final Rule, all residential LBP waste can now be managed in C&D landfills, and the national average cost of hauling and disposal to C&D landfills is $99.04 per ton, then the baseline cost of residential LBP waste management would drop to $102.48 million, for a savings of $23.19 million per year.

As seen in Table 4-5, however, the combined cost of hauling and transport between MSWLFs and C&D landfills varies by region. In the Midwest, Northeast and South, the cost to haul and dispose of residential LBP waste in C&D landfills is less than the cost for MSW landfills, but the opposite is true

[11] The transportation share of total costs ranges from 23.6 percent to 47.6 percent, depending on the region and type of landfill.

in the West. Consequently, the amount of waste shifted from MSW landfills to C&D landfills as a result of the Direct Final Rule will be less than 100 percent, and the actual savings will be less than the full $23.19 million per year.

Table 4-7. Comparative Costs of Residential LBP Waste Management in C&D Landfills and MSWLFs

Activity	Abatement	Renovation and remodeling	Total
Baseline Quantity of Waste Generated (tons)	48,723	985,994	1,034,717
percent	4.7%	95.3%	100.0%
Cost of transport and disposal ($/ton)			
MSW landfill		$121.46	
C&D landfill		$99.04	
Total cost			
MSW landfill	$5,917,896	$119,758,831	$125,676,727
C&D landfill	$4,825,526	$97,652,846	$102,478,372

Source: Tables 2-5, 2-8, and 4-1, 4-2, and 4-3.

For this analysis, EPA assumes that only residential LBP waste generators in the Midwest, Northeast, and South regions would potentially shift disposal from MSW landfills to C&D landfills. EPA further assumes that the percentage of residential LBP waste that is affected is proportional to the share of these three regions in the number of housing units with LBP (84.4 percent, from Table 4-6). Table 4-8 indicates that, under these assumptions, a maximum total of 873,300 tons of residential LBP waste could be diverted from MSW landfills to C&D landfills annually. This shift in disposal would save residential LBP waste generators in the Midwest, Northeast, and South regions up to $15.98 million annually. Table 4-8 allocates these savings to abatement and R&R activity based on the percentage of national residential LBP waste generation each accounts for (from Table 4-7). As seen, the savings accruing to generators of residential LBP abatement waste could range up to $0.79 million per year, while the savings accruing to generators of residential R&R waste could range up to $15.98 million per year. The exact magnitude of the savings will depend on the quantity of waste that is diverted from MSWLFs to C&D landfills, which in turn will depend on the quantities of waste being generated and the relative costs of transport and disposal to MSW and C&D landfills faced by the individual generator.

Table 4-8 Estimated Potential Savings from the Direct Final Rule (annual)

Data Element	National Data	Midwest	Northeast	South	Midwest + Northeast + South
Share of housing units with LBP (a)	100.0%	31.0%	28.0%	25.4%	84.4%
Total waste from residential abatement and R&R (tons) (b)	1,034,716	320,762	289,720	262,818	873,300
Disposal cost to MSW ($/ton) (c)	--	$114.39	$170.71	$115.61	--
Disposal Cost to C&D ($/ton)		$88.44	$150.41	$105.87	
Cost Differential ($/ton) (d)		$25.95	$20.30	$9.74	
Total savings (bxd)	--	$8,323,773	$5,881,326	$2,559,846	**$16,764,945**
Abatement	4.7%	$391,217	$276,422	$120,313	**$787,952**
R&R	95.3%	$7,932,556	$5,604,903	$2,439,533	**$15,976,992**

Note: The exact magnitude of the savings will depend on the quantity of waste that is diverted from MSWLFs to C&D landfills, which in turn will depend on the quantities of waste being generated and the relative costs of transport and disposal to MSW and C&D landfills faced by the individual generator.

4.4 Costs to States and Territories

EPA assumes, for purposes of this analysis, that States would incur the costs associated with a typical notice and comment rulemaking (although it is up to the States and territories to decide the procedures to implement the rule). In previous analyses, EPA has estimated that the costs of promulgating a simple rulemaking at the State level (EPA 1998). States are assumed to incur $2,194 in costs for preparing a written amendment to their RCRA Subtitle D rules, $90 in costs for publishing a written notice of the proposed amendment requesting comment, and $4,000 in costs for holding a public hearing on the amendment. As shown in Table 4-9, the total cost per State is estimated at $6,284. Since 49 States and territories operate EPA-approved MSW permitting programs, the total cost to States of implementing the rule is $307,916.

EPA emphasizes that there is no federal mandate requiring States and territories to adopt these changes into their RCRA Subtitle D programs. Since the changes will provide the States with greater flexibility in managing residential LBP waste and reduce the potential for confusion over the regulatory status of residential LBP waste, EPA assumes that most States will undertake this revision, even if it involves a small, but not insignificant, regulatory change (i.e., an estimated $6,284 per State).

Table 4-9. Costs to States and Territories of Adopting the Direct Final Rule

Cost Item	Amount
Drafting written regulatory amendment	$2,194
Public notice	$90
Public hearing	$4,000
Subtotal	*$6,284*
Number of States/territories operating approved RCRA Subtitle D programs	49
Total costs to States and territories	**$307,916**

Source EPA 1998.

CHAPTER FIVE

BENEFITS ANALYSIS

The previous chapter estimated that the national impact of the Direct Final Rule would be an estimated savings in the Midwest, Northeast, and South of up to $16.7 million per year in residential LBP waste management costs. These savings will accrue to those who pay the costs of residential abatement and R&R activities, who will pay less to dispose of the waste generated from abatements and R&R projects. As seen in Table 4-8, the majority of the savings, up to $15.9 million per year, will accrue to those undertaking R&R projects, while a lesser amount, up to $784,471 per year, will accrue to those undertaking LBP abatements.

EPA assumes that the savings accruing to those undertaking R&R projects are unlikely to be used to undertake further projects that eliminate LBP from housing. Similarly, savings accruing to owners of private housing units undergoing abatement are unlikely to be used to further reduce LBP hazards. In the case of public housing, however, EPA believes that any savings generated as a result of this action are in fact likely to be directed towards further reducing exposure to lead. Acting through HUD, the Federal Government pays for abatements in public housing under the Comprehensive Improvement Assistance Program. Funds for abatement are administered by public housing authorities (PHAs) across the country. These agencies, some of which are local government units, generally operate with an annual budget dedicated to abating lead hazards in public housing developments. Assuming that funding to PHAs continues at the same level and costs of abatement go down, cost savings realized under the rule can be directly used to finance additional abatements.

To estimate the number of additional public housing abatements that will potentially result from this Direct Final Rule, EPA first assumes that the savings accruing to abatement will be split between private housing owners and public housing owners according to the number of abatements undertaken by each. While current data reviewed for this analysis do not provide this allocation, estimates developed for the December 1998 proposed rulemaking indicated that in 1996 there 60.3 percent of abatements took place in private housing and 39.7 percent took place in public housing units (EPA 1998; see Table 2-5). Given this, the share of savings accruing to PHAs can also be estimated at 39.7 percent, which translates to $312,817 ($787,952 x 0.397). These savings are then divided by the average cost of abatement to determine the increased demand for public housing abatements.

The current average cost of abatement in public housing units is estimated to range from $2,300 to $5,000 (EPA 1996a). Using the midpoint of this range, $3,650, the $312,817 in savings will fund the abatement of up to 86 additional units per year. Table 5-1 summarizes these calculations.

Table 5-1. Summary of Benefit Estimates

Savings accruing to abatement	$787,952
Percent of abatements occurring in public housing units	39.7%
Savings accruing to owners of public housing units	$312,817
Average cost of public housing unit abatement	$3,650
Number of additional abatements that can be financed	86

Sources: Savings accruing to abatement are calculated in Chapter 4 (see Table 4-7). The percent of abatements in public housing and average cost of abatement are from EPA 1998.
Note: The exact magnitude of the savings will depend on the quantity of waste that is diverted from MSWLFs to C&D landfills, which in turn will depend on the quantities of waste being generated and the relative costs of transport and disposal to MSW and C&D landfills faced by the individual generator.

CHAPTER SIX

IMPACTS OF THE ACTION

EPA's estimates of the costs and benefits of this action are undertaken pursuant to Executive Order (EO) 12866, *Regulatory Planning and Review*. This chapter presents additional analyses and discussion of the potential impact of the Direct Final Rule. Specifically, this chapter addresses four other regulatory assessment provisions:

- The Regulatory Flexibility Act (RFA) (5 U.S.C. 601 *et seq.*) and its subsequent amendment under the Small Business Regulatory Enforcement Fairness Act (SBREFA)—Under these two legislative actions, EPA is required to determine if the regulatory action would have a significant impact on a substantial number of small entities, where entities are defined as businesses, governmental units, or organizations (e.g., non-profits). If EPA determines that the action would have such an impact, the Agency is required to performed a more detailed Regulatory Flexibility Analysis.

- The Unfunded Mandates Reform Act (UMRA) (P.L. 104-4)—This legislative action requires EPA to assess the potential for the proposed rule to impose unfunded mandates on State, local, and tribal governments and the private sector.

- EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*—Under this EO, EPA assesses the extent to which regulatory actions impose disproportionate high adverse environmental or human health effects on minority or low-income populations.

- EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*—Under this EO, EPA identifies and assesses environmental, health, and safety risks that may disproportionately affect children.

Section 6.1 summarizes the impacts of the Direct Final Rule. Section 6.2 considers the impact of the Direct Final Rule on small entities to assist EPA in determining whether there is a need for a Regulatory Flexibility Analysis in accordance with the RFA and the SBREFA. Section 6.3 addresses burdens on governmental entities other than the Federal government, in accordance with UMRA. Section 6.4 analyzes the environmental justice impacts of the regulation in accordance with Executive Order 12898. Finally, Section 6.5 addresses the impacts of the Direct Final Rule on health and safety risks faced by children.

6.1 Summary of Impacts

The Direct Final Rule is deregulatory in nature and will impose no incremental costs on private entities nor any new direct costs on governments. The principal impact of the action will be to reduce the disposal costs for generators of residential LBP waste. The exact magnitude of the savings will depend on how much LBP waste disposal will be diverted from MSW landfills to C&D landfills, which in turn will depend on the relative costs of each disposal option faced by generators. EPA estimates the potential magnitude of the savings at up to $0.79 million per year for generators of residential LBP abatement waste and up to $15.98 million per year for generators of residential R&R waste, for a total combined savings estimated at up to $16.76 million per year.

The $16.76 million in potential annual savings are estimated to accrue in regions of the country where the total cost of hauling and disposal of residential LBP waste to C&D landfills is lower than the total cost of hauling and disposal of residential LBP waste in MSWLFs. Based on regional cost data, EPA estimates that costs will generally be reduced in the Midwest, Northeast, and South regions. In other regions, specifically the West, costs for disposal to C&D landfills are estimated to be higher than the costs for disposal to MSW landfills. As a result, the Direct Final Rule is not predicted to lead to shifts in disposal in this region.

The total quantity of waste estimated to potentially shift from MSWLFs to C&D landfills is 0.87 million tons per year. In 2000, the United States was expected to dispose of 119.0 million tons of waste in MSWLFs.[12] The quantity of waste that would potentially be diverted thus represents less than 0.73 percent of the total municipal solid waste stream.

6.2 Small Entity Impact Analysis

EPA considered the potential adverse impacts of the Direct Final Rule on small entities, in accordance with the requirements of the Regulatory Flexibility Act (RFA) and the Small Business Regulatory Enforcement Fairness Act (SBREFA).[13] Both the RFA and SBREFA require EPA to determine whether rulemakings may result in substantial adverse impacts on a significant number of small entities, and if so, to tailor the requirements so as to mitigate such impacts, while still achieving a high level of environmental protection.

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[12] http://www.epa.gov/epaoswer/non-hw/muncpl/factbook/internet/mswf/disp.htm#3

[13] The SBREFA law was passed by Congress on March 29, 1996. Subtitle D of SBREFA amends the RFA and requires agencies to prepare more detailed analyses of regulatory impacts on small entities. The requirements apply to rules proposed or promulgated after June 28, 1996.

Based on the cost analysis of this report, it was determined that the Direct Final Rule imposes no incremental costs or other burdens on small entities. EPA has determined that a formal small entity analysis was not required for this action.

6.4 Unfunded Mandates Analysis

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), P.L. 104-4, establishes requirements for Federal agencies to assess the effects of their regulatory actions on State, local, and tribal governments and the private sector. Under section 202 of UMRA, EPA generally must prepare a written statement, including a cost-benefit analysis, for proposed and final rules with "Federal mandates" that may result in expenditures to State, local, and tribal governments, in the aggregate, or to the private sector, of $100 million or more in any one year.

The Direct Final Rule imposes no direct costs on State and local governments as a result of any Federal mandate. Chapter 4 of this Economic Analysis estimates that States and territories electing to implement the amendments to the definitions of MSWLF, C&D landfill, and residential LBP waste may do so in order to obtain greater flexibility in managing the disposal of residential LBP waste in their jurisdiction. The total estimated cost of implementing these changes in all 49 States and territories with approved MSW landfill permitting programs is $307,916 (see Table 4-8). These changes are voluntary, however, and as such EPA has determined that the rule is not subject to the requirements of sections 202, 204 and 205 of UMRA. Furthermore, the total cost of these changes is below $100 million per year, which is the threshold for conducting the unfunded mandates analysis.

6.5 Environmental Justice Analysis

Under EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, EPA assesses the extent to which regulatory actions impose disproportionate adverse high environmental or human health effects on minority or low-income populations.

EPA has identified no aspects of the Direct Final Rule that would result in a disproportionately high incidence of environmental or human health effects associated with this rulemaking. On the contrary, since the rule would reduce the cost of performing LBP abatements, EPA assumes that the savings will afford public housing authorities, in particular, the opportunity to conduct additional abatements of LBP hazards in affected housing units. Since the tenants of public housing units are more likely to be minority and lower-income households, the action should have the effect of providing a differential benefit to such populations.

6.6 Children's Health Analysis

Pursuant to EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, EPA has reviewed the Direct Final Rule for its impacts on children's health. Although EPA has determined that the EO does not apply to this action, the rule will have the effect of reducing the risk faced by individuals who are exposed as children in public housing units affected by the action. The savings from this action are estimated to be sufficient to finance an additional 86 abatements in public housing units annually.

CHAPTER SEVEN

CONCLUSIONS AND SUMMARY

The Direct Final Rule is deregulatory in nature and will impose no incremental costs on private entities nor any new direct costs on governments. The principal impact of the action will be to reduce the disposal costs for generators of residential LBP waste. The exact magnitude of the savings will depend on how much LBP waste disposal will be diverted from MSW landfills to C&D landfills, which in turn will depend on the relative costs of each disposal option faced by generators. EPA estimates the potential magnitude of the savings at up to $0.79 million per year for generators of residential LBP abatement waste and up to $15.98 million per year for generators of residential R&R waste, for a total combined savings estimated at up to $16.76 million per year.

The $16.76 million in potential annual savings are estimated to accrue in regions of the country where the total cost of hauling and disposal of residential LBP waste to C&D landfills is lower than the total cost of hauling and disposal of residential LBP waste in MSWLFs. Based on regional cost data, EPA estimates that costs will be reduced in the Midwest, Northeast, and South regions. In the West, costs for disposal to C&D landfills are estimated to be higher than the costs for disposal to MSWLFs. As a result, the authorization of residential LBP waste disposal to C&D landfills is not predicted to lead to shifts in disposal in this region.

Of the $16.76 million in potential annual savings, $0.79 million will accrue to generators of residential LBP abatement waste and $15.98 million will accrue to generators of residential R&R waste. EPA assumes that only the savings accruing to generators of LBP waste in public housing are likely to be used directly to fund additional LBP hazard reduction activities, since public housing authorities (PHAs) generally operate with an annual budget dedicated to abating lead hazards in public housing developments. Assuming that funding to PHAs continues at the same level and costs of abatement go down, cost savings realized under this action can be directly used to finance additional abatements. The magnitude of the savings expected to accrue to PHAs is $0.31 million per year. Given an average abatement cost of $3,650, these savings will potentially fund the abatement of an additional 86 units per year.

The total quantity of waste estimated to shift from MSW to C&D landfills is 0.87 million tons per year. In 2000, the United States was expected to dispose of 119.0 million tons of waste in MSWLFs. The quantity of waste that would be diverted thus represents 0.73 percent of the total municipal solid waste stream.

CHAPTER EIGHT

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